WHAT IS CLAIMED IS

1. A method for conserving power in a wireless ad hoc network, comprising:

receiving, in a device, a burst via the wireless network, the burst including a preamble, a postamble and one or more blocks of data, the device being in one of a low power state and a powered off state at a time when the preamble is received:

determining whether the preamble of the burst includes data indicating an ID of the receiving device;

when the determining determines that the preamble includes the data indicating the ID of the receiving device, performing:

deriving, from the preamble, information indicating a time and a duration for powering on one or more components of the device to receive the one or more blocks of data included in the burst;

powering on the one or more components at a first time period based on the derived information in order to receive the data in a block of the one or more blocks, the powering on continuing for a first duration of time based on the derived information;

powering off the one or more components at a specific time period from a beginning of the first time period based on the derived information;

repeating the powering on and the powering off for each of the one or more blocks of data in the burst; and

processing the received one or more blocks of data.

2. The method of claim 1, wherein the processing comprises:

powering on a second component of the receiving device after a second time period occurs after a beginning of reception of the postamble.

3. The method of claim 2, wherein the second component includes a digital signal processor configured to process the received one or more blocks of data.

4. The method of claim 1, wherein the one or more components include an analog-to-digital converter configured to convert a received one of the blocks of data from analog to digital form.

5. The method of claim 1, further comprising:

powering on a low noise amplifier simultaneously with a first execution of the powering on of the one or more components for the received burst; and

powering off the low noise amplifier after reception of a last one of the blocks of data of the received burst.

6. The method of claim 1, wherein the network includes a plurality of devices, the method further comprising synchronizing the plurality of devices.

7. The method of claim 6, wherein the deriving, the powering on, the powering off, the repeating and the processing are performed when the determining determines that the preamble includes the data indicating the ID of the receiving device and the burst is

received within a narrow window within a time slot, including a narrow time window of a time slot boundary.

8. The method of claim 6, wherein the deriving, the powering on, the powering off, the repeating and the processing are performed when the determining determines that the preamble includes information indicating the ID of the receiving device, and the burst is received within a narrow time window of a time slot and a collision-free reception occurred.

9. The method of claim 1, further comprising:

deriving from the preamble, information regarding interference; and

deriving from at least one of the one or more data blocks, the information regarding interference; and

when the information regarding interference indicates an occurrence of an unacceptable level of interference, aborting the receiving of the burst.

10. The method of claim 1, further comprising:

generating a wake-up signal when the determining determines that the preamble includes the data indicating the ID of the receiving device, wherein

-the deriving occurs responsive to the generating of the wake-up signal.

11. The method of claim 1, wherein the burst is a direct-sequence spread spectrum transmitted burst.

12. The method of claim 11, wherein the received burst was transmitted with a superposition of direct-sequence spread spectrum cyclic-shifted codes, wherein each of the direct-sequence spread spectrum cyclic-shift codes is a cyclic-shift of a base code, including a pseudo-random noise sequence having a sequence of a plurality of chips, each chip having a value that is one of a binary number, an integer-valued number, a real-valued number, and a complex-valued number.

13. The method of claim 12, wherein each of the cyclic shift codes is multiplied by one of a bit and a modulated-data-symbol.

14. The method of claim 13, wherein each of the modulated-data-symbols conveys information of at least one or more bits.

15. The method of claim 13, wherein each of the cyclic-shift codes, after being multiplied by the bit or the modulated data symbol, are added together forming a multi-code block.

16. The method of claim 15, wherein the first of the cyclic-shift codes is cyclically-padded at an end by at least as many chips as a number of cyclic-shift codes included in the multi-code block, including unused cyclic-shift codes.

17. The method of claim 15, wherein the last of the cyclic-shift codes is cyclically-padded at a beginning by at least as many chips as a number of cyclic-shift codes included in the multi-code block, including unused cyclic-shift codes.

18. The method of claim 15, wherein respective intermediated ones of the cyclic-shift codes are cyclically padded at an end and at a beginning by as many chips as a relative position of the respective intermediated ones of the cyclic-shift codes in the multi-code sub-burst.

19. The method of claim 15, wherein the cyclic-shift codes include cyclic-padding having additional chips at an end and at a beginning to accommodate signal extensions that occur due to the non-zero length of an impulse response of a channel between a transmitter and a receiver.

20. The method of claim 13, wherein information is transmitted in bursts, each burst composed of consecutive multi-code sub-bursts, including a preamble sub-burst with at least two cyclic-codes, one or more data sub-bursts, each with one or more cyclic-codes, and postamble sub-bursts with at least two cyclic-codes.

21. The method of claim 20, wherein at least one of an amplitude, a phase of the modulated data symbols, and a cyclic-shift separation between consecutive ones of the cyclic-shift codes in the preamble conveys structural information regarding a time composition of a remaining portion of the burst.

22. The method of claim 21, wherein the preamble includes two cyclic shift codes at M+K cyclic-shifts apart, where M is a number of modulated data symbols transmitted per data sub-burst and K is a total length of an impulse response of a channel between a transmitter and a receiver measured in chip times.

23. The method of claim 20, wherein at least one of an amplitude, a phase, and a cyclic-shift separation between consecutive ones of the cyclic-shift codes in the postamble conveys additional structural information about a time composition of a preceding portion of the burst.

24. The method of claim 23, wherein the postamble includes two cyclic shift codes at K cyclic-shifts apart, where K is a total length of an impulse response of a channel between a transmitter and a receiver measured in a number of chips.

25. The method of claim 20, wherein the one or more data sub-bursts are encoded using one or more cyclic-codes with consecutive cyclic-shifts, each of the one or more data sub-bursts of a burst includes an equal number of cyclic-codes.

26. The method of claim 20, wherein the cyclic-codes in the preamble, the data sub-bursts, and the postamble sub-bursts are generated from a common base sequence.

27. The method of claim 20, wherein different bursts transmitted from a transmitting device use different base sequences and include a different number of data sub-bursts per burst.

28. The method of claim 20, wherein data sub-bursts of different bursts use modulation constellations with a different number of bits per modulated-data-symbol.

29. The method of claims 14, wherein a multi-code sub-burst is received, by the device, with a filter matched to a base code.

30. The method of claim 29, wherein the filter includes Surface Acoustic Wave technology at a convenient intermediary frequency or a radio frequency.

31. The method of claim 14, wherein:

a multi-code sub-burst is received, by the device, with a cyclic correlator matched to a base code, and

after being sampled and stored, the received sub-burst is correlated with all cyclic codes included in a multi-code sub-burst.

32. The method of claim 31, wherein the cyclic correlator is implemented in one of hardware and software using Fast Fourier Transform techniques.

33. The method of claim 29, wherein a signal at an output of the filter, after being down-converted from radio frequency to baseband frequency, results in a sequence of modulated data symbols that, in an absence of noise, reproduces a sequence of modulated data symbols used, by the transmitter, to multiply the cyclic codes included in the each of multi-code sub-bursts.

34. The method of claim 33, wherein each cyclic shift of a received multi-code sub-burst corresponds to one chip time of the signal at the output of the filter.

35. The method of claim 33, wherein a time-domain signal detected at the output of the filter reproduces the sequenced transmission of the modulated-data-symbols of the each of the multi-code sub-bursts over a channel between a transmitter and a receiver, with a transmission being performed at a rate of one modulated data symbol per chip time, including one chip-time of guard-time for each unused cyclic shift-code in the each of the multi-code sub-bursts.

36. The method of claim 29, wherein the preamble detected at the output of the filter is used as a wake-up signal comprising two pulses at a distance of M+K chip-times from each other, where M is a number of bits or modulated-data-symbols included in each of the subsequent data sub-bursts, and K is a number of chip times required to flush out the filter.

37. The method of claim 36, wherein a value, M+K, is used to power on a low noise amplifier simultaneously with a first execution of the powering on of the one or more components, including the powering on of devices performing sample-and-hold (S/H) and analog to digital (A/D) conversion, and a memory device used to store sampled data.

38. The method of claim 35, wherein the postamble detected at the output of the filter is used as an end-of-burst signal comprising two pulses at a distance of K chip times apart, where the value K is a number of chip times required to flush out the filter.

39. The method of claim 38, wherein the end-of-burst signal is used to power off a low noise amplifier simultaneously with a last execution of the powering off of a last received block of data in the burst, including powering off of devices performing sample-and-hold (S/H) and analog to digital (A/D) conversion, and a temporary memory device used to store sampled data.

40. The method of claim 38, wherein the end-of-burst signal is used to power on a Direct-to-Memory Access device used for transferring the data from the temporary memory to another memory.

41. The method of claim 38, wherein a processor is powered on when or after a last block of data in the burst is transferred from the temporary memory to another memory.

42. The method of claim 38, wherein, at the end-of burst signal, a value, K, is used to reassemble the received burst from the received data sub-bursts.

43. The method of claim 38, wherein a processor is powered off or put on a low power mode after assembling and processing a received burst.

44. The method of claim 12, wherein multiple devices transmit simultaneously and each transmission is to one of a specific device, a group of devices, and broadcast to all receiving devices in the network.

45. The method of claim 12, wherein a base code is uniquely-assigned to the device, and the uniquely-assigned base code indicates a unique ID for the receiving device.

46. The method of claim 44, wherein a base code is uniquely-assigned to each of the devices, and the uniquely-assigned base code indicates a unique ID for the each of the devices.

47. The method of claim 46, wherein a base code, distinct from any of the uniquely-assigned base codes, is assigned to the group of devices, and the assigned base code indicates a unique group ID or multicast ID for a group of devices.

48. The method of claim 47, wherein a base code, distinct from any of the uniquely-assigned base codes, and also distinct from any of the group ID base codes assigned to groups of devices, is assigned to all devices in the network, and the assigned base code indicates a network broadcast ID.

49. The method of claim 12, wherein a receiving device having a broadcast ID is equipped with at least a filter or a cyclic correlator that is matched to a base code indicating a network broadcast ID.

50. The method of claims 12, wherein a receiving device having a group ID is equipped with a filter or a cyclic correlator that is matched to a base code indicating a receiving device group ID.

51. The methods of claim 12, wherein the device has a unique ID and is equipped with a filter or a cyclic correlator that is matched to a base code indicating the unique ID of the device.

52. The method of claim 51, wherein the matching base code for the cyclic correlator is programmable.

53. The method of claim 51, wherein operations of the filter are performed by hardware, software, or combination thereof.

54. The method of claim 51, wherein an input signal for the filter or the cyclic correlator is sampled and stored, and correlating operations are made consecutively and as required to check for matches with a base code indicating either a network broadcast ID, a receiving device group ID, or the unique ID of the device.

55. The method of claim 49, wherein the network broadcast ID is used by a transmitting device to inform one or more neighbor receiving devices of their own node unique ID and an eventual group ID.

56. The method of claims 1, wherein the burst includes a base code indicating one of a broadcast ID and a group ID that includes information indicating a first of a plurality of cyclic codes used in the preamble, the block of data or the postamble.

57. The method of claim 56, wherein the first of the cyclic codes indicates a number of chip-times from a start of time-slot in which a first data symbol used in each of the data blocks is detected.

58. The method of claim 1, wherein:

the burst includes a cyclic code from a base sequence indicating a broadcast ID, and

the device measures a timing event indicating a start of burst time relative to a start of a closest time-slot.

59. The method of claim 58, further comprising:

using transmission and reception times to determine a signal propagation time, including delays related to signal filtering operations performed at a transmitter and at a receiver.

60. A method for encoding and transmitting a burst of data from a transmitter to a receiver using low or no power while waiting for reception of the data, the method comprising:

transmitting a wake-up signal to the receiver, the wake-up signal providing structural information of an epoch, including the burst of data, to be used by the receiver for reception of the burst of data; and

transmitting at least one block of data to the receiver;

61. The method of claim 60, wherein the transmitting of the at least one block of data further includes using a direct-sequence spread spectrum transmission method to transmit the burst of data.

62. The method of claim 61, wherein the transmitting of the at least one block of data further includes using a sequence of modulated data symbols to transmit the burst of data.

63. The method of claim 60, further comprising:

synchronizing to a common accurate time source based on utilizing global positioning satellite information.

64. The method of claim 63, wherein the transmitter is synchronized with the receiver and has information regarding a location of the receiver, the transmitting further comprising transmitting the wake-up signal such that it arrives at the receiver within a window of a time slot boundary.

65. The method of claim 60, further comprising:

synchronizing to a common accurate time source based on using an atomic clock.

66. The method of claim 65, wherein the transmitter is synchronized with the receiver and has information regarding a location of the receiver, the transmitting further comprising transmitting the wake-up signal such that it arrives at the receiver within a window of a time slot boundary.

67. The method of claim 60, wherein the wake-up signal comprises two pseudo-random noise sequence codes transmitted a distance of M+K chip times apart, where M is a number of bits to be transmitted per data block and K is an amount of chip time, in addition to a time to transmit the M number of bits, required for all of the M bits to be flushed from a matched filter included in the receiver.

68. A receiver configured to use low or no power when waiting to receive a burst of data, the receiver comprising:

a correlator configured to use low or no power when waiting to receive the data;

a low noise amplifier configured to receive and amplify analog signals from the correlator;

an analog-to-digital converter configured to convert the amplified analog signals from the low noise amplifier to digital signals; and

logic configured to process the digital signals from the analog-to-digital converter, wherein

when the correlator determines that the receiver is an intended destination of the received data, the correlator generates a wake-up signal.

69. The receiver of claim 68, wherein the wake-up signal causes one or more components to be activated to process a block of the received data and then deactivated after the block is processed.

70. The receiver of claim 68, wherein the wake-up signal is derived from a received spread spectrum signal and comprises two high-gain pulses.

71. The receiver of claim 70, wherein the two high-gain pulses are M+K chip times apart, where M is a number of bits to be transmitted per data block and K is an amount of chip time, in addition to a time to transmit the M number of bits, required for all of the M number of bits to be flushed from the correlator.

72. The receiver of claim 68, wherein one or more components of the receiver are configured to be activated at a first time period based on derived structural information from a preamble of the burst including the data, the one or more components being configured to remain activated for a first duration of time based on the derived structural information.

73. The receiver of claim 72, wherein the one or more components include the analog-to-digital converter.

74. The receiver of claim 73, wherein the low noise amplifier is configured to be activated simultaneously with a first activation of the analog-to-digital converter for a received burst.

75. The receiver of claim 68, wherein the receiver is configured to be synchronized with a plurality of devices in a wireless network.

76. The receiver of claim 68, wherein the correlator is configured to generate the wake-up signal only when the burst of data is received within a window of a time slot boundary.

77. The receiver of claim 68, wherein the correlator is configured to generate the wake-up signal only when the burst of data is received within a window of a time slot boundary and a collision-free reception occurred.

78. A transmitter for transmitting a burst of data to a receiver having low or no power while waiting for reception of the burst of data, the transmitter comprising:

a processor to process signals to be transmitted to the receiver;

a digital-to-analog converter configured to convert the signals from the processor from a digital form to an analog form;

an up-converter configured to convert the analog signals from a baseband to an RF band;

a filter configured to filter the RF band signal; and

an antenna configured to transmit the RF band signal, wherein

the transmitter is configured to transmit a wake-up signal to the receiver, the wake-up signal including structural information of an epoch, the transmitter transmitting at least one block of data in a first epoch, and

the transmitter is configured to remain in a powered off state until an existence of data to be transmitted.

79. The transmitter of claim 78, wherein the transmitter is configured to transmit the burst of data using a direct-sequence spread spectrum transmission technique.

80. The transmitter of claim 78, wherein the wake-up signal comprises two pseudo-random noise codes transmitted a distance of M+K chip times apart, where M is a number of bits to be transmitted per data block and K is an amount of chip time, in addition to a time to transmit the M number of bits, required for all of the M bits to be flushed from a matched filter included in the receiver.

81. The transmitter of claim 80, wherein the transmitter is configured to be synchronized with the receiver.

82. The transmitter of claim 78, wherein the transmitter is configured to have access to location information of the receiver, the transmitter being configured to use the location information to transmit the burst of data, including the wake-up signal, such that the wake-up signal arrives at the receiver within a narrow time window of a time slot boundary.

83. A receiver configured to use low or no power when waiting to receive a burst of data, the receiver comprising:

means for correlating configured to use low or no power, the means for correlating including means for generating a wake-up signal;

means for amplifying received analog signals from the means for correlating;

means for converting the amplified analog signals, from the means for amplifying, to digital signals; and

means for processing the digital signals from the means for converting the amplified analog signals, wherein

when the means for correlating determines that the receiver is an intended destination of the received data, the means for generating the wake-up signal generates the wake-up signal.

84. The receiver of claim 83, wherein the wake-up signal causes one or more components of the receiver to be activated to process a block of the received data and then deactivated after the block is processed.

85. The receiver of claim 83, wherein the wake-up signal comprises two PN codes transmitted a distance of M+K chip times apart, where M is a number of bits to be transmitted per data block and K is an amount of chip time, in addition to a time to transmit the M number of bits, required for all of the M bits to be flushed from the means for correlating.

86. A transmitter for transmitting a burst of data to a receiver having low or no power, the transmitter comprising:

means for processing signals including data to be transmitted to the receiver;

means for converting the signals from the means for processing from a digital form to an analog form;

means for up-converting the analog signals from a baseband to an RF band;

means for filtering the RF band signal;

means for retrieving location information of the receiver; and

means for transmitting the RF band signal to the receiver, wherein

the means for transmitting is configured to transmit a wake-up signal to the receiver, the wake-up signal including structural information of an epoch, the means for transmitting being further configured to transmit at least one block of data in a first epoch,

the means for transmitting is further configured to remain in a powered off state until an existence of the data to be transmitted, and

the means for transmitting is further configured to use the location information to transmit the wake-up signal to the receiver, such that the wake-up signal arrives at the receiver within a window of a time slot boundary at the receiver.